

## **Innovation-05**

### **1. Brief Name of the Innovation:**

A Novel Hybrid Co-ordination method for interference management in femtocell based broadband OFDMA cellular system

### **2. Contact Information:**

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### **3. What is the technology?**

The prime technology is femtocell base station.

### **4. What does the technology do?**

Femtocell is a miniature base station operating in very low power (typically <20dBm) and deployed in user premises in sporadic manner. Femtocells can operate either in the same band as existing Macro/Microcellular base station (known as co-channel deployment) or in a separate band (known as dedicated channel deployment). Due to the reduced distance between base station and mobile station, the signal degradation would be very less leading to high throughput.

### **5. Explain the specific problem this technology has created to address or solve:**

The specific problems addressed by femtocell are as follows:-

- i) Mitigation of Indoor Coverage issue (due to wall penetration losses)
- ii) Very High throughput for the indoor/nomadic users

### **6. Why is it better? How much better?**

The femtocell base stations are deployed in the user premise. Hence the path-loss between base station and mobile station are reduced thereby improving the link budget. From our result it has been observed that upto 44 fold increase in Area Spectral Efficiency is achievable with the co-channel deployment of femtocell in UMi scenario.

**7. Have you filed for Intellectual Property (IP)?Have Patent Cooperation Treaty (PCT) applications filed?**

Due to unplanned deployment of femtocell, high interference is expected to occur in dense urban scenario with co-channel operation and femto and macro network. In this study, one key area for filing IP is identified which will consider a hybrid co-ordination method between macro and femto network. The relevant work is in progress.

**8. What is the development stage of this innovation**

Ideation and validation is done using widely acclaimed system level simulation methodology. High level patent search is also completed in US patent database. Concretizing the concept and drafting the patent is in progress.

**9. Have any prospective users or buyers shown interest in this technology?**

So far no.

**10. Who do you consider competitors or competing technology?**

Wi-Fi, Distributed Antenna System (DAS) can be considered even though femtocell is leading in the race.

**11. List the milestones remaining to be accomplished to bring your technology to full development and ready for the intended end-user?**

Following milestones are aimed at this:

- i) Concretizing the concept with discrete results and validation of the algorithm and/or architecture.
- ii) Identification of a manufacturing vendor willing to deploy femtocell in the market (e.g. Qualcomm, Airvana etc)

**12. Broad Technical Specifications**

*[Not sure about this]*

### 13. Diagram or Pictures (if any):

Following diagram shows a high level overview of the hybrid architecture of femto-macro network

